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AIMS Future Teachers to STEM (FT2STEM)

Fall 2021 Report

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Overview

- Background
- Methods
- Results
- Program Recommendations

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Background

- The AIMS FT2STEM supplemental award supports an increase in the number of under-represented minority students with degrees in STEM that pursue and attain a teacher certification to teach in STEM subject areas
- Grant term: 10/1/19 – 9/30/21
- FT2STEM provides scholarships for 10 participants. These participants attend workshops with NASA JPL and Discovery Cube, and co-lead, with a master teacher, an afterschool robotics club in a high-needs school

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Background Continued

- Explore student experiences within the AIMS-FT2STEM supplemental program
- Research Questions:
  - How does participation in a STEM-focused elementary and secondary education teacher preparation program shape student experiences for Hispanic and low-income students?
  - How does pre-service teacher mentoring by in-service teachers shape Hispanic and low-income students in a STEM-focused elementary and secondary teacher preparation program?

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Methods

- Case study design
  - Weekly structured journal prompts in Canvas
    - 30 total structured journal prompts were posted
    - Of the 11 total participants, 8 completed at least 1 journal entry
    - A total of 87 journal entries were recorded
  - One virtual individual interview
    - One 35-minute virtual interview included questions exploring general project participation, faculty mentors, and teacher preparation in STEM

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Results – Thematic Categories

- Developing a Professional Identity and Learning to Teach: Pre-Service Student Teacher Experience with Career Preparation
- Grit and Attitude: Exploring Broader Meaning in Training to be a Teacher
- Gaining Knowledge and Support from Professionals: Mentor Teachers, Student Teaching, and Professors
- Virtual Experiences
- Focusing on the Program: Participant Feedback Participation

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Developing a Professional Identity and Learning to Teach: Pre-Service Teacher Experiences with Career Preparation

- Confidence in Teaching Ability

  The student teachers generally feel prepared to take what they are learning and use it in their own classrooms

  - "I am **confident** that I will come out of the program **completely prepared** with the skills necessary to create a wonderful and educational classroom setting"

- Preparing for the Classroom Through Practice and Lesson Plans

  A way student teachers are gaining confidence and preparing for the classroom is by learning to create lesson plans and rehearsing with their classmates

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Developing a Professional Identity and Learning to Teach: Pre-Service Teacher Experiences with Career Preparation

- Learning Strategies to Diversify the STEM Pipeline

  Student teachers are learning to teach children with different learning styles from different backgrounds

  - "If we can teach our students derived lesson plans from NASA or Discovery Cube it will make more students of color capture in [sic] interest in the sciences."

- Creative Instructional Strategies

  From “messy science experiments” to “cross-department collaboration,” they generally plan to use creativity in the classroom to capture the attention of students

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Grit and Attitude: Exploring Broader Meaning in Training to be a Teacher

- Broadening Horizons – Impacting What Students Think is Possible

  Student Teachers understand the importance of their role for future generations and they generally want to help children expand what they think is achievable

  - "I am thrilled to be apart of a program that is so necessary to the future of expanding and broadening of children's prospective of the world and what they can achieve."
  - "I am glad to become a STEM scholar and present my students with opportunities that didn't seem like an option."

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Grit and Attitude: Exploring Broader Meaning in Training to be a Teacher

- Exploring an Identity and Interest in the Teaching Profession
  - Beyond the Subject Matter – Helping Students Learn More About Themselves
    - "I want to teach STEM in my own classroom because…students learn now to be determined and **try until they reach their goals**, they **learn to collaborate** with their team members, they must be reflective on their choices and they **learn how to push themselves** to try new and different things."
  - Creating a Safe Space to Learn

    They desire to create a nurturing and encouraging learning environment
    - "STEM learning can **push students out of their comfort zone** and that can cause frustration and discomfort, so I want to make sure that I can **provide support and guidance** that makes this learning process painless and fun!"

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Gaining Knowledge and Support from Professionals: Mentor Teachers, Student Teaching, and Professors

- Mentor Teachers
  - Trouble Establishing the AIMS FT2STEM Mentor/Mentee Relationship

    There was some initial confusion as to the expectations of the mentor program. Also, there was some difficulty in gaining access to mentor teacher virtual classrooms
  - Examples of Professionally Meaningful AIMS FT2STEM Mentor/Mentee Relationships

    Student teachers mostly achieved a beneficial relationship by the end of the program
    - "…he's constantly **sharing little tips** of um you should get Google certified. That'll make you stand out on your resume. …if you need a **letter of recommendation**, I got you. "
    - "I feel so grateful to be working with my mentor teacher. She has great rapport with her students and **I've learned so much** from her already."

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Gaining Knowledge and Support from Professionals: Mentor Teachers, Student Teaching, and Professors

- Leading by Example: Supportive Examples Provided by Professors

  Their professors lead by example in the classroom and modeled positive behavior and support

  - "…this one professor in particular truly showed me how much of an ally she really is. She did not need to tell me that her behavior was to be modeled, it was obvious that utmost of care was how I should proceed with my students."
  - "I cannot wait to cheer on my students the way that she has for me. This is what education is all about - helping and guiding others towards their successes."

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Virtual Experiences

- Speaking from the Perspective of a Student

  Learning in the virtual environment is challenging but overall the student teachers are generally satisfied with their classroom experience

- From Engaged Student to Effective Teacher

  Pulling from their own classroom experience in their graduate level education courses, the student teachers are generally able to create a supportive online environment for the younger students they work with.

  - "In my Mathematical Curriculum and Methods class, we learned about certain websites that provide online manipulatives and so I was able to use a website with some of the fifth graders online. We used a virtual number line to compare decimals and that visual representation really helped the group I was working with."

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Virtual Experiences

- Challenges and Concerns

  Even with new resources, learning and teaching in a virtual environment has challenges in creating an engaging learning environment. There was also concern about student teaching in an online environment and later transitioning into a face-to-face classroom

  - “I have yet to work in a classroom and feel as if student teaching via **Zoom will not be great enough access** to get all of the preparation and understanding I will need to manage a real life classroom, myself."
  - “Online learning has been a difficult transition and several of our students are still learning how to transition to a different style of learning. My mentor teacher and I are **struggling with student engagement** and we continue to work together to create engaging lessons for our students.”

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Focusing on the Program: Critical and Constructive Participant Feedback Participation

- How to Navigate Teaching as a Career: Requirements, Graduate School, and Other Professional Options

  Request for more assistance in navigating teaching credential requirements as well as professional and graduate school options

- Complimentary Feedback and Experiences

  Student teachers are generally satisfied with the program

  - "…the existence of **the program is vital** to helping us educators be the teachers we're meant to be."
  - "I'm also a huge **fan of this weekly journaling**. It reminds me to reflect on specific aspects of being a credential candidate that are not normally asked or reviewed in the classes currently required."

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Focusing on the Program: Critical and Constructive Participant Feedback Participation

- Recommendations to Strengthen the AIMS-FT2STEM Student Teacher Experience
  - Contact information and resource list from STEM-Integrated Learning Workshop
    - "…I found myself scrabbling for scratch paper because there were so many useful resources."
    - "I felt the workshop brought in some great speakers and resources…I wrote down a could [sic] names and emails, but would **benefit from an official list of contacts**."
  - More cohort interactions
    - "Yes, there was an orientation at the start of the semester, but meeting at least one more time and seeing what other students are doing - like **a check-in - would be nice**."
    - "Some sort of meeting in which we all touch bases with other participants within the AIMS-FT2STEM could be beneficial."

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- Questions?

Thank you